

Our Ref: 20193/LO.001/KMM

Mr. Jordan Wheawall

3 September 2020

Dear Jordan

**GROUND INVESTIGATION
FORMER PARADISE NURSERIES, WINNOTHDALE, CHEADLE**

Introduction

Georisk Management Limited (Georisk) has been instructed by Mr. J. Wheawall to carry out a ground investigation for the construction of a new residential property at the above site.

Fieldwork and Laboratory Testing

The fieldwork was carried out on 6 August 2020 and comprised the following elements:

- 5 No. hand trial pits, designated TP01 to TP05, excavated to a maximum depth of 0.2 m below existing ground level (begl);
- chemical and geotechnical laboratory testing.

The positions of the exploratory holes were set out by Georisk and are shown on the Exploratory Hole Location Plan included as Drawing No. 20193/1 in Appendix A.

The fieldwork was supervised by Georisk. All soil description and sample logging was carried out in accordance with BS 5930 (2015) and the exploratory hole records are presented in Appendix B.

Small disturbed samples were recovered from the trial pits as necessary to facilitate sample description and for subsequent laboratory analysis.

Representative samples of near-surface soil were scheduled for chemical (contamination) testing and tests to assist with buried concrete design. The testing was carried out an independent UKAS accredited laboratory and the results are presented in Appendix C.

Routine geotechnical testing comprising moisture content and Atterberg Limit determinations has been scheduled on near surface soil. The testing was carried out in accordance with BS1377 (1990) at an independent UKAS accredited laboratory and the results are presented as Appendix D.

Ground Conditions

Upon arrival the site had been levelled to create a development platform by cutting into the existing slope in the south and tracking in the excavated arisings in the north. A photograph of the site as encountered is presented below;



Lodgedale Member

As the site had been completely stripped of topsoil / Made Ground the observable natural material comprised dark reddish brown gravelly (fine to coarse round quartz/sandstone) sand.

Samples of Lodgedale Member were scheduled for Atterberg Limit determinations and natural moisture content testing. The test results are included in Appendix D and summarised below:

Test	Minimum (%)	Maximum
Liquid Limit	22	-
Plastic Limit	Non-Plastic	-
Plasticity Index	Non-Plastic	-
Moisture Content	3.5	-
Plasticity	Non-Plastic	-
Volume Change Potential	Non-Shrinkable	-

Groundwater

Groundwater was not observed during the site works.

Long-term groundwater level monitoring was beyond the scope of this assessment.

Human Health Risk Assessment

The UK approach to the assessment of contaminated land is based upon the principles of risk assessment, which is founded on the use of “*source-pathway-target*” principles to establish the potential presence of “*pollutant linkage*”. The main legislative driver for dealing with historical land affected by contamination is Part 2A of the Environmental Protection Act 1990. Under Part 2A, land is considered to be contaminated if it is determined that there is a ‘*Significant Possibility of Significant Harm*’ (SPOSH) to human health.

Georisk adopts a tiered approach to risk assessment in accordance with current UK guidance and good practice. The initial step of this process, known as Tier 1, is the comparison of site-derived data with relevant guideline levels.

The following hierarchy has been adopted by Georisk for determining which assessment criteria to be followed:

- Suitable 4 Use Levels (S4UL) developed by LQM/CIEH (2015);
- CLEA SGV;
- C4SL (in the absence of other assessment criteria);
- Soil Screening Values developed by Atkins ATRISKsoil.

The assessment criteria used for the screening of contaminants is summarised below:

Contaminant Group	Determinands	Assessment Criteria Selected
ORGANIC CONTAMINANTS		
Non-halogenated hydrocarbons	Phenol	LQM/CIEH S4UL
Polyaromatic Hydrocarbons (PAH)	USEPA 16 priority compounds	LQM/CIEH S4UL
INORGANIC CONTAMINANTS		
Metals	Lead	C4SL
	Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Selenium, Zinc	LQM/CIEH S4UL
Non-metals	Cyanide	Atkins AtRisk Soil Screening Value (SSV)

It should be noted that there is no S4UL for lead and that the SGV for lead has been withdrawn. As such, the only available authoritative published criteria for lead is the DEFRA C4SL. The C4SL for lead is considerably more conservative than the former SGV and is therefore considered appropriate for use.

End Use

In view of the proposed development, a ‘residential with homegrown produce’ with 1 % organic matter content end use conceptual model has been adopted for the assessment of this site.

Generic Human Health Risk Assessment

The chemical test results are presented in Appendix C and are summarised below:

Contaminant of Concern	Measured Concentration (mg/kg)		Critical Concentration (S4UL/C4SL/SSV) (mg/kg)	Number of Results that Exceed S4UL/C4SL/SSV
	Minimum	Maximum		
Arsenic	3.3	5.4	37	0 (2)
Cadmium	<0.10	-	11	0 (2)
Chromium	7.8	8.6	910	0 (2)
Copper	11	-	2400	0 (2)
Cyanide	<0.50	-	34	0 (2)
Lead	4.1	5.9	200	0 (2)
Mercury	<0.10	-	40	0 (2)
Nickel	5.7	7.1	130	0 (2)
Phenol	<0.30	-	120	0 (2)
Selenium	<0.20	-	250	0 (2)
Zinc	10	12	3700	0 (2)
PAH Compounds				
Acenaphthene	<0.10	-	210	0 (2)
Acenaphthylene	<0.10	-	170	0 (2)
Anthracene	<0.10	1.8	2400	0 (2)
Benzo(a)anthracene	<0.10	3.0	7.2	0 (2)
Benzo(a)pyrene	<0.10	2.3	2.2	1 (2)
Benzo(b)fluoranthene	<0.10	3.1	2.6	1 (2)
Benzo(ghi)perylene	<0.10	1.2	320	0 (2)
Benzo(k)fluoranthene	<0.10	1.2	77	0 (2)
Chrysene	<0.10	3.0	15	0 (2)
Dibenz(ah)anthracene	<0.10	0.29	0.24	1 (2)
Fluoranthene	<0.10	9.3	280	0 (2)
Fluorene	<0.10	-	170	0 (2)
Indeno(123-cd)pyrene	<0.10	1.3	27	0 (2)
Naphthalene	<0.10	-	2.3	0 (2)
Phenanthrene	<0.10	5.8	95	0 (2)
Pyrene	<0.10	9.0	620	0 (2)

The majority of the test results were recorded below their relevant S4UL/C4SL/SSV with the exception of results for the following PAH compounds in TP05:

- benzo(a)pyrene;
- benzo(b)fluoranthene;
- dibenz(ah)anthracene.

Two samples of near-surface soil were screened for the presence of asbestos; asbestos was not identified in any of the samples analysed.

RISK EVALUATION AND REMEDIAL ACTION PLAN

Risk Evaluation

Following risk assessment utilising data obtained from the investigation, the table overleaf identifies the remaining pollutant linkages as being of concern in terms of the redevelopment of the site:

Source	Pathway	Receptor
Localised elevated concentrations of PAHs in near surface soil	Dermal contact	Site user: female child 0-6 years
		Site construction worker
	Ingestion	Site user: female child 0-6 years
		Site construction worker
	Consumption of home-grown vegetables grown contaminated soil	Site user: female child 0-6 years
	Ingestion of soil attached to home-grown vegetables	Site user: female child 0-6 years
	Dermal contact with dust derived from contaminated soil	Site user: female child 0-6 years
	Ingestion of dust derived from contaminated soil	Site user: female child 0-6 years
	Direct contact	Water supply pipework

Remedial Action Plan - Human Health

Future site users should be considered as receptors by physical contact, ingestion and dust inhalation associated with potentially contaminated soil beneath gardens. For housing with private gardens, root uptake by vegetation of any contamination present in the near surface soils also needs to be considered.

It is considered that a potential pollutant linkage exists with the future end users by ingestion (dust and soil), inhalation (dust and soil), consumption of vegetables (and soils attached to vegetables) and direct dermal contact.

This investigation has identified the localised presence of marginally elevated levels of PAH compounds in the near surface soil in the centre of the site (TP05).

As TP05 was put down beneath the proposed build, coupled with only marginal exceedances of threshold levels, it is considered that no plausible significant pollutant pathway exists to future site users.

Accordingly, remedial action is not required, subject to regulatory acceptance.

It is recommended that clean imported topsoil should be placed in all garden areas to provide a suitable growing medium.

Water Supply Pipes

It is considered that standard water supply pipes laid in trenches with clean gravel backfill should be suitable at the site; however, it is recommended that a copy of this report is supplied to utility companies and that their recommendations relating to appropriate supply pipes are adhered to.

General Comments

Should any areas of previously unidentified potentially contaminated soil be encountered during construction works, we would recommend consultation with Georisk to ensure that our recommendations continue to apply. Any potentially contaminated soils should be left in situ pending further assessment.

During the redevelopment of the site, construction workers are likely to be in direct contact with the near surface soils and appropriate Health and Safety measures will need to be implemented based on the findings of this investigation.

Neighbouring sites may be potentially exposed to residual contamination through generation of dust through site redevelopment activities. This risk is manageable by implementing an appropriate construction management plan; for example, dust suppression, thus removing any potential pollutant linkage.

If required to satisfy planning or land quality conditions, this report should be submitted to the Local Authority and/or NHBC/warranty provider for approval prior to finalising development levels and before any construction work starts on site.

Foundation Design

This inspection has recorded dark reddish-brown gravelly sand through the length of the cut in the former slope and this material has been used to create the level development platform. Any foundations should extend through any loose/soft material and or Made Ground/reengineered natural soils to bear on to undisturbed natural soils.

Anecdotally, Georisk understands that the cut material has been placed in tracked layers using a 360 backhoe excavator to a maximum thickness of approximately 1.5 m begl.

Considering the observed stability of the material exposed within the 4 m deep cut, we anticipate a medium dense consistency. Accordingly, it is recommended that strip/trench fill foundations extend into the undisturbed medium dense granular material, allowing for a minimum 300 mm penetration for surety.

For strip/trench fill foundations placed in medium dense Lodgedale Member material, an allowable bearing pressure of 150 kN/m² is considered appropriate with total settlements not anticipated to exceed 25 mm.

The Lodgedale Member is classified as a non-plastic and non-shrinkable material and; therefore, tree influence is not of concern.

Care should be taken to limit the exposure of any excavation prepared to receive concrete, which may cause deterioration and a reduction in bearing capacity.

Foundation excavations should be inspected by qualified personnel and any soft/loose materials that are encountered should be removed and replaced with compacted granular fill or lean mix concrete.

Floor Slabs

Although the near-surface soil is non-shrinkable, half of the development area has been subjected to non-engineered uplifted fill material. Accordingly, it is recommended that a suspended floor slab design is adopted for the new development.

Excavations

Due to the presence of lightly compacted re-engineered granular material across half of the development site, it is recommended that shoring support is allowed for.

Given the absence of any observable groundwater in the cut, groundwater is unlikely to significantly affect the proposed development. In the event groundwater/seepage is encountered it should be readily controllable via sump pumping.

Buried Concrete Design

For the near-surface soils, water soluble sulphate testing results (expressed as SO₄ in a 2:1 water:soil extract) ranged from <0.01 g/l with pH values of 7.9 to 8.1. Following the guidance given in the BRE Special Digest 1 (2005) and assuming 'mobile' groundwater conditions for a 'brownfield' site, the Aggressive Chemical Environment for Concrete (ACEC) classification has been determined. These results indicate a Design Sulphate Class of DS-1 and an ACEC class of AC-1 apply at the site.

We trust this letter report meets your requirements; however, should you have any queries please do not hesitate to contact us.

Yours sincerely



Keith Mottram
Principal Geotechnical Engineer
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keith.mottram@georisk-uk.com

APPENDIX A
EXPLORATORY HOLE LOCATION PLAN

Notes

This drawing is the copyright of georisk management ltd and may not be reproduced, copied or used without express written permission.

This drawing is to be read in conjunction with all development drawings, and designers risk assessments.

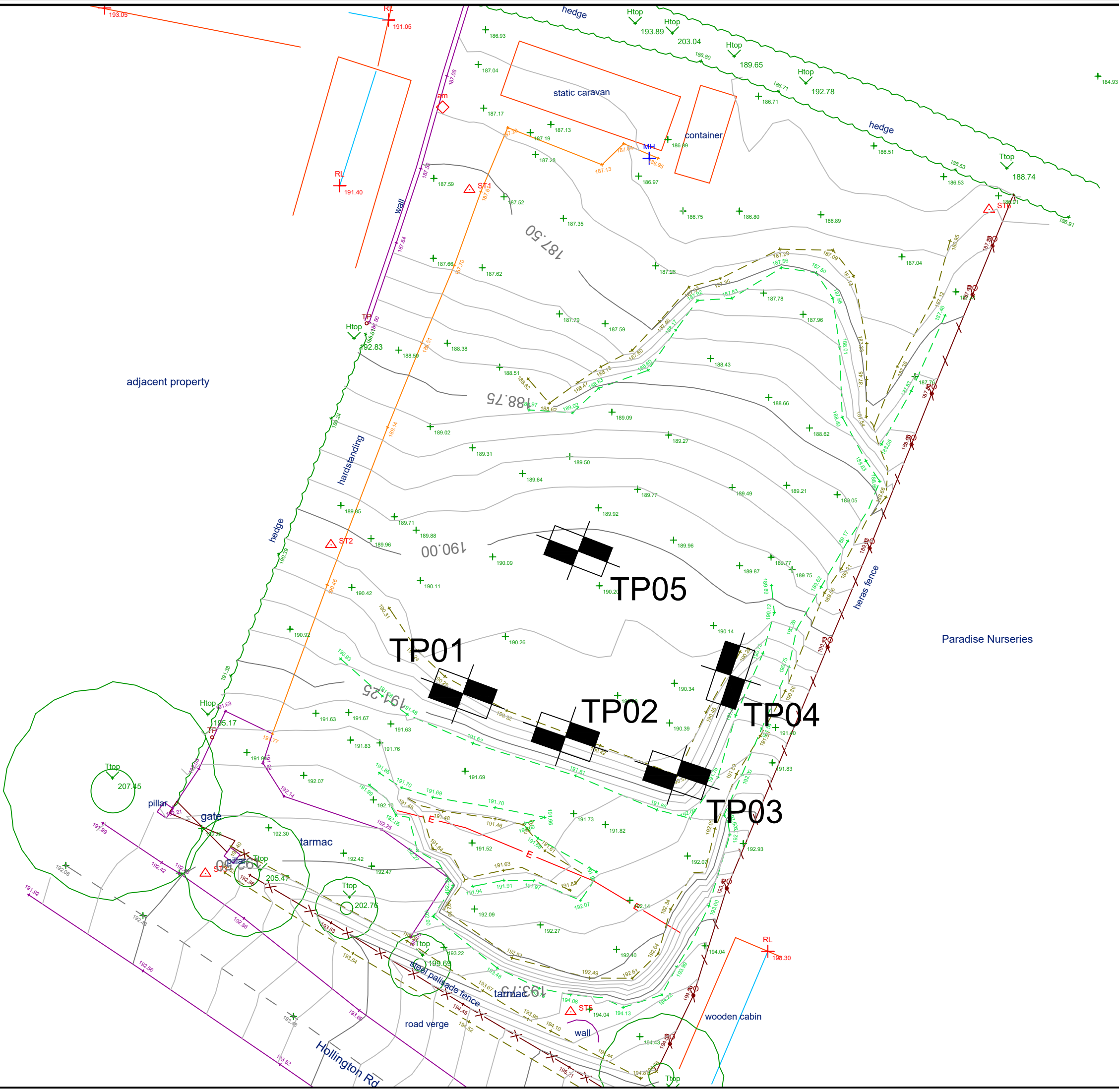
This drawing must not be scaled. Work to figured dimensions only.

KEY

TP1

Trial Pit

Rev	Date	Description	Initials
Client			
MR J. WHEAWALL			
georisk MANAGEMENT			
Summit Point, Summit Crescent, Smethwick, Birmingham B66 1BT t: 0121 553 4044, f: 0121 553 1112 www.georisk-uk.com, email: enquiries@georisk-uk.com			
Contract			
FORMER PARADISE NURSERIES WINNOTHDALE, CHEADLE			
Drawing Title			
EXPLORATORY HOLE LOCATION PLAN			
Drawing Status		FINAL	
Drawn By	AEB	Date	02/09/20
Checked/Approved	KMM	Date	02/09/20
Scale	NTS	Drawing Number	20193/1



APPENDIX B
EXPLORATORY HOLE RECORDS

[illegible]

Stability: Pit sides stable.

Stability: Pit sides stable.

[illegible]

[illegible]

APPENDIX C
CHEMICAL TEST RESULTS



2183

Final Report

Report No.: 20-21819-1
Initial Date of Issue: 26-Aug-2020
Client Georisk Management Limited
Client Address: Summit Point
Summit Crescent Industrial Est
Smethwick
Birmingham
B66 1BT
Contact(s): Alex Bichard
Keith Mottram
Mark Gill
Project 20193 Former Paradise Nurseries,
Winnothdale

Quotation No.:		Date Received:	18-Aug-2020
Order No.:	20193	Date Instructed:	18-Aug-2020
No. of Samples:	2		
Turnaround (Wkdays):	5	Results Due:	24-Aug-2020
Date Approved:	26-Aug-2020		

Approved By:



Details: Glynn Harvey, Technical Manager

Results - Soil

Project: 20193 Former Paradise Nurseries, Winnothdale

Client: Georisk Management Limited	Chemtest Job No.:				20-21819	20-21819
Quotation No.:	Chemtest Sample ID.:				1050273	1050274
	Sample Location:				TP04	TP05
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.20	0.20
	Date Sampled:				10-Aug-2020	10-Aug-2020
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-
Moisture	N	2030	%	0.020	5.4	5.3
Stones and Removed Materials	N	2030	%	0.020	< 0.020	< 0.020
pH	U	2010		4.0	7.9	8.1
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	< 0.010	< 0.010
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	U	2450	mg/kg	1.0	5.4	3.3
Cadmium	U	2450	mg/kg	0.10	< 0.10	< 0.10
Chromium	U	2450	mg/kg	1.0	8.6	7.8
Copper	U	2450	mg/kg	0.50	11	11
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	7.1	5.7
Lead	U	2450	mg/kg	0.50	5.9	4.1
Selenium	U	2450	mg/kg	0.20	< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	12	10
Total TPH >C6-C40	U	2670	mg/kg	10	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	5.8
Anthracene	U	2700	mg/kg	0.10	< 0.10	1.8
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	9.3
Pyrene	U	2700	mg/kg	0.10	< 0.10	9.0
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	3.0
Chrysene	U	2700	mg/kg	0.10	< 0.10	3.0
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	3.1
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	1.2
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	2.3
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	1.3
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	0.29
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	1.2
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	41
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

APPENDIX D
GEOTECHNICAL TEST RESULTS



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Georisk Management Limited
Client Address: Summit Point, Summit Crescent,
Smethwick, Birmingham,
B66 1BT
Contact: Keith Mottram
Site Address: Former Paradise Nurseries, Winnothdale

Client Reference: 20193
Job Number: 20-24415
Date Sampled: 07/08/2020
Date Received: 12/08/2020
Date Tested: 27/08/2020
Sampled By: KMM

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

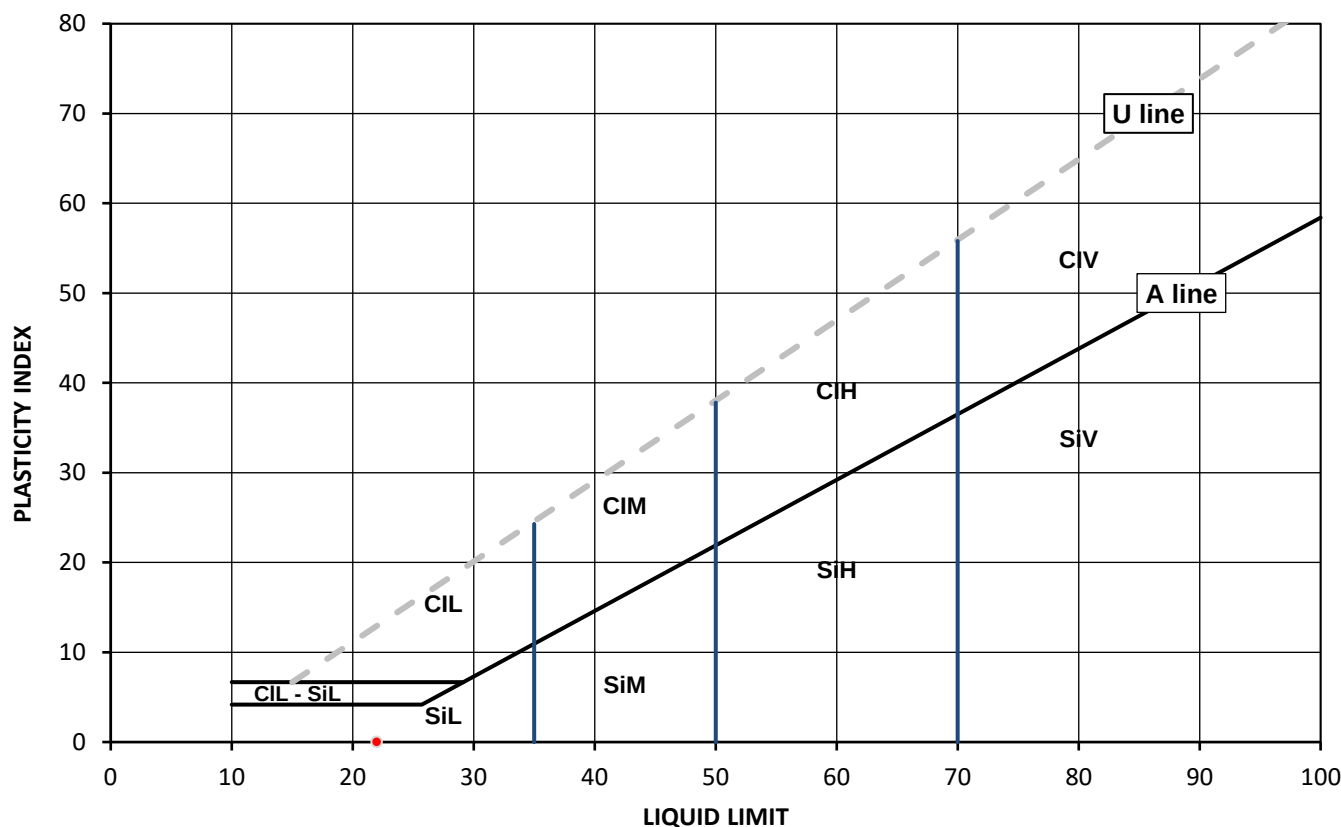
Test Results:

Laboratory Reference: 1591171
Hole No.: TP02
Sample Reference: Not Given
Soil Description: Reddish brown gravelly SAND

Depth Top [m]: 4.20
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
3.5	22	NP	NP	46



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

Cl	Clay	Plasticity	L	Low	Liquid Limit	below 35
Si	Silt		M	Medium		35 to 50
			H	High		50 to 70
			V	Very high		exceeding 70
			O	Organic		append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks: NP - non plastic

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



4041

Client: Georisk Management Limited
 Client Address: Summit Point, Summit Crescent,
 Smethwick, Birmingham,
 B66 1BT
 Contact: Keith Mottram
 Site Address: Former Paradise Nurseries, Winnothdale

SUMMARY REPORT

Summary of Classification Test Results

Tested in Accordance with:

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN
 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test),
 Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

i2 Analytical Ltd
 Unit 8 Harrowden Road
 Brackmills Industrial Estate
 Northampton NN4 7EB



Environmental Science

Client Reference: 20193
 Job Number: 20-24415
 Date Sampled: 07/08/2020
 Date Received: 12/08/2020
 Date Tested: 27/08/2020
 Sampled By: KMM

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
1591170	TP01	Not Given	2.60	Not Given	D	Reddish brown very sandy GRAVEL		5.2											
1591171	TP02	Not Given	4.20	Not Given	D	Reddish brown gravelly SAND	Atterberg 1 Point	3.5		46	22	NP	NP						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Monika Janoszek
 PL Deputy Head of Geotechnical Section
 for and on behalf of i2 Analytical Ltd

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